



2nd Revised 256-152div corrected in response to notice to comply.txt  
SEQUENCE LISTING

<110> YOUNG, ANDREW A.  
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BEELEY, NIGEL R.A.  
PRICKETT, KATHRYN S.

<120> INOTROPIC AND DIURETIC EFFECTS OF GLP-1 AND GLP-1 AGONISTS

<130> 256-152DIV US

<140> 10/656,093

<141> 2003-09-05

<160> 75

<170> PatentIn Ver. 2.1

<210> 1

<211> 39

<212> PRT

<213> Heloderma horridum

<220>

<223> Exendin-3

<400> 1

His Ser Asp Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Pro Ser  
20 25 30

Ser Gly Ala Pro Pro Pro Ser  
35

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<212> PRT

<213> Heloderma suspectum

<220>

<223> Exendin-4

<400> 2

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Pro Ser  
20 25 30

Ser Gly Ala Pro Pro Pro Ser  
35

<210> 3

<211> 30

<212> PRT

<213> Homo sapiens

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<223> GLP-1

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<400> 3  
His Ala Glu Gly Thr Phe Thr Ser Asp Val Ser Ser Tyr Leu Glu Gly  
1 5 10 15

Gln Ala Ala Lys Glu Phe Ile Ala Trp Leu Val Lys Gly Arg  
20 25 30

<210> 4  
<211> 39  
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<213> Artificial Sequence

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<223> Description of Artificial Sequence: Exendin or  
exendin agonist

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<221> MOD\_RES  
<222> (1)  
<223> His, Arg or Tyr

<220>  
<221> MOD\_RES  
<222> (2)  
<223> Ser, Gly, Ala or Thr

<220>  
<221> MOD\_RES  
<222> (3)  
<223> Asp, Ala or Glu

<220>  
<221> MOD\_RES  
<222> (5)  
<223> Ala or Thr

<220>  
<221> MOD\_RES  
<222> (6)  
<223> Ala, Phe, Tyr or naphthylalanine

<220>  
<221> MOD\_RES  
<222> (7)  
<223> Thr or Ser

<220>  
<221> MOD\_RES  
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<223> Ala, Ser or Thr

<220>  
<221> MOD\_RES  
<222> (9)  
<223> Asp or Glu

<220>  
<221> MOD\_RES  
<222> (10)  
<223> Ala, Leu, Ile, Val, pentylglycine or Met

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<220>  
<221> MOD\_RES  
<222> (11)  
<223> Ala or Ser

<220>  
<221> MOD\_RES  
<222> (12)  
<223> Ala or Lys

<220>  
<221> MOD\_RES  
<222> (13)  
<223> Ala or Gln

<220>  
<221> MOD\_RES  
<222> (14)  
<223> Ala, Leu, Ile, pentylglycine, Val or Met

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<222> (15)...(17)  
<223> Ala or Glu

<220>  
<221> MOD\_RES  
<222> (19)  
<223> Ala or Val

<220>  
<221> MOD\_RES  
<222> (20)  
<223> Ala or Arg

<220>  
<221> MOD\_RES  
<222> (21)  
<223> Ala or Leu

<220>  
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<222> (22)  
<223> Phe, Tyr or naphthylalanine

<220>  
<221> MOD\_RES  
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<223> Ile, Val, Leu, pentylglycine, tert-butylglycine or Met

<220>  
<221> MOD\_RES  
<222> (24)  
<223> Ala, Glu or Asp

<220>  
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<222> (25)  
<223> Ala, Trp, Phe, Tyr or naphthylalanine

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<222> (26)

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<223> Ala or Leu

<220>  
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<223> Ala or Lys

<220>  
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<220>  
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<223> Gly

<220>  
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<222> (30)  
<223> Gly

<220>  
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<222> (31)  
<223> Pro, homoproline, 3Hyp, 4Hyp, thioproline, N-alkylglycine  
N-alkylpentylglycine or N-alkylalanine

<220>  
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<223> Ser

<220>  
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<221> MOD\_RES  
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<223> Gly

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<221> MOD\_RES  
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<223> Ala

<220>  
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<222> (36)..(38)  
<223> Pro, homoproline, 3Hyp, 4Hyp, thioproline, N-alkylglycine  
N-alkylpentylglycine or N-alkylalanine

<220>  
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<223> Ser, Thr or Tyr

<220>  
<223> provided no more than three of Xaa3, Xaa5, Xaa6, Xaa8,  
Xaa10, Xaa11, Xaa12, Xaa13, Xaa14, Xaa15, Xaa16, Xaa17,  
Xaa19, Xaa20, Xaa21, Xaa24, Xaa25, Xaa26, Xaa27 or Xaa28

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are Ala; and the compound is not exendin-3 or exendin-4

<220>

<223> this peptide may encompass 28-39 residues, wherein  
residues 1-28 are constant and residues 29-39 may vary  
in length according to the specification

<400> 4

Xaa Xaa Xaa Gly Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
1 5 10 15

Xaa Ala Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
20 25 30

Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
35

<210> 5

<211> 30

<212> PRT

<213> Artificial Sequence

<220>

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GLP-1 agonist

<220>

<223> C-term may be amidated

<400> 5

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly  
20 25 30

<210> 6

<211> 28

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 6

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn  
20 25

<210> 7

<211> 28

<212> PRT

<213> Artificial Sequence

<220>

2nd Revised 256-152div corrected in response to notice to comply.txt  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 7

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

<210> 8

<211> 28

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 8

His Ala Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

<210> 9

<211> 28

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 9

His Gly Glu Gly Ala Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

<210> 10

<211> 28

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GLP-1 agonist

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<220>

<223> C-term amidated

<400> 10

His Gly Glu Gly Thr Ala Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

<210> 11

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<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 11

His Gly Glu Gly Thr Phe Thr Ala Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

<210> 12

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<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 12

His Gly Glu Gly Thr Phe Thr Ser Asp Ala Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

<210> 13

<211> 28

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

2nd Revised 256-152div corrected in response to notice to comply.txt

<400> 13  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ala Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

<210> 14  
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<212> PRT  
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<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<223> C-term amidated

<400> 14  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Ala Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

<210> 15  
<211> 28  
<212> PRT  
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<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<223> C-term amidated

<400> 15  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Ala Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

<210> 16  
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<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<223> C-term amidated

<400> 16  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Ala Glu Glu  
1 5 10 15



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Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

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GLP-1 agonist

<220>  
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<400> 17  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Ala Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

<210> 18  
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<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<223> C-term amidated

<400> 18  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Ala  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

<210> 19  
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<220>  
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GLP-1 agonist

<220>  
<223> C-term amidated

<400> 19  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Ala Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

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<210> 20  
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GLP-1 agonist

<220>  
<223> C-term amidated

<400> 20  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15  
Glu Ala Ala Arg Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

<210> 21  
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<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<223> C-term amidated

<400> 21  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15  
Glu Ala Val Ala Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

<210> 22  
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<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<223> C-term amidated

<400> 22  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15  
Glu Ala Val Arg Ala Phe Ile Glu Phe Leu Lys Asn  
20 25

<210> 23

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<211> 28

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 23

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Ala Phe Leu Lys Asn  
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<210> 24

<211> 28

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

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His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Ala Leu Lys Asn  
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<210> 25

<211> 28

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

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<223> C-term amidated

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His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Ala Lys Asn  
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<210> 26

<211> 28

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<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 26

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Ala Asn  
20 25

<210> 27

<211> 28

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

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<400> 27

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Ala  
20 25

<210> 28

<211> 38

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 28

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Pro Ser  
20 25 30

Ser Gly Ala Pro Pro Pro  
35

<210> 29

<211> 38

<212> PRT

<213> Artificial Sequence

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<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 29

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn Gly Gly Pro Ser  
20 25 30

Ser Gly Ala Pro Pro Pro  
35

<210> 30

<211> 37

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<400> 30

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Pro Ser  
20 25 30

Ser Gly Ala Pro Pro  
35

<210> 31

<211> 37

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 31

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn Gly Gly Pro Ser  
20 25 30

Ser Gly Ala Pro Pro  
35

<210> 32

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<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 32

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Pro Ser  
20 25 30

Ser Gly Ala Pro  
35

<210> 33

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 33

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn Gly Gly Pro Ser  
20 25 30

Ser Gly Ala Pro  
35

<210> 34

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<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 34

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Pro Ser  
20 25 30

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Ser Gly Ala  
35

<210> 35  
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<212> PRT  
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<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<223> C-term amidated

<400> 35  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn Gly Gly Pro Ser  
20 25 30

Ser Gly Ala  
35

<210> 36  
<211> 34  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<223> C-term amidated

<400> 36  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Pro Ser  
20 25 30

Ser Gly

<210> 37  
<211> 34  
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<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<223> C-term amidated

2nd Revised 256-152div corrected in response to notice to comply.txt

<400> 37  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15  
Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn Gly Gly Pro Ser  
20 25 30  
Ser Gly

<210> 38  
<211> 33  
<212> PRT  
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<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<223> C-term amidated

<400> 38  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15  
Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Pro Ser  
20 25 30  
Ser

<210> 39  
<211> 33  
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<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

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<223> C-term amidated

<400> 39  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15  
Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn Gly Gly Pro Ser  
20 25 30  
Ser

<210> 40  
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<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 40

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Pro Ser  
20 25 30

<210> 41

<211> 32

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 41

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn Gly Gly Pro Ser  
20 25 30

<210> 42

<211> 31

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<400> 42

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Pro  
20 25 30

<210> 43

<211> 31

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

2nd Revised 256-152div corrected in response to notice to comply.txt

<400> 43

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn Gly Gly Pro  
20 25 30

<210> 44

<211> 30

<212> PRT

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<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<400> 44

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn Gly Gly  
20 25 30

<210> 45

<211> 29

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<400> 45

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly  
20 25

<210> 46

<211> 29

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 46

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn Gly  
20 25

<210> 47

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<211> 38

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<221> MOD\_RES

<222> (31)

<223> tPro

<220>

<221> MOD\_RES

<222> (36)..(38)

<223> tPro

<220>

<223> C-term amidated

<400> 47

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Xaa Ser  
20 25 30

Ser Gly Ala Xaa Xaa Xaa  
35

<210> 48

<211> 38

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<221> MOD\_RES

<222> (36)..(38)

<223> tPro

<220>

<223> C-term amidated

<400> 48

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Pro Ser  
20 25 30

Ser Gly Ala Xaa Xaa Xaa  
35

<210> 49

<211> 37

<212> PRT

2nd Revised 256-152div corrected in response to notice to comply.txt

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<221> MOD\_RES

<222> (31)

<223> NMeala

<220>

<223> C-term amidated

<400> 49

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Xaa Ser  
20 25 30

Ser Gly Ala Pro Pro  
35

<210> 50

<211> 37

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<221> MOD\_RES

<222> (31)

<223> NMeala

<220>

<221> MOD\_RES

<222> (36)..(37)

<223> NMeala

<220>

<223> C-term amidated

<400> 50

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Xaa Ser  
20 25 30

Ser Gly Ala Xaa Xaa  
35

<210> 51

<211> 37

<212> PRT

<213> Artificial Sequence

2nd Revised 256-152div corrected in response to notice to comply.txt

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<221> MOD\_RES

<222> (31)

<223> hPro

<220>

<221> MOD\_RES

<222> (36)..(37)

<223> hPro

<220>

<223> C-term amidated

<400> 51

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Xaa Ser  
20 25 30

Ser Gly Ala Xaa Xaa  
35

<210> 52

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<221> MOD\_RES

<222> (31)

<223> hPro

<220>

<221> MOD\_RES

<222> (36)

<223> hPro

<220>

<223> C-term amidated

<400> 52

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Xaa Ser  
20 25 30

Ser Gly Ala Xaa  
35

<210> 53

<211> 35

2nd Revised 256-152div corrected in response to notice to comply.txt

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 53

Arg Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Pro Ser  
20 25 30

Ser Gly Ala  
35

<210> 54

<211> 30

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 54

His Gly Asp Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly  
20 25 30

<210> 55

<211> 28

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<221> MOD\_RES

<222> (6)

<223> Naphthylala

<220>

<223> C-term amidated

<400> 55

His Gly Glu Gly Thr Xaa Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn

2nd Revised 256-152div corrected in response to notice to comply.txt  
20 25

<210> 56  
<211> 28  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<223> C-term amidated

<400> 56  
His Gly Glu Gly Thr Phe Ser Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15  
Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn  
20 25

<210> 57  
<211> 28  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<223> C-term amidated

<400> 57  
His Gly Glu Gly Thr Phe Ser Thr Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15  
Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn  
20 25

<210> 58  
<211> 28  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<223> C-term amidated

<400> 58  
His Gly Glu Gly Thr Phe Thr Ser Glu Leu Ser Lys Gln Met Ala Glu  
1 5 10 15  
Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn  
20 25

2nd Revised 256-152div corrected in response to notice to comply.txt

<210> 59  
<211> 28  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<221> MOD\_RES  
<222> (10)  
<223> pentylgly

<220>  
<223> C-term amidated

<400> 59  
His Gly Glu Gly Thr Phe Thr Ser Asp Xaa Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn  
20 25

<210> 60  
<211> 28  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<221> MOD\_RES  
<222> (22)  
<223> Naphthylala

<220>  
<223> C-term amidated

<400> 60  
His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Xaa Ile Glu Phe Leu Lys Asn  
20 25

<210> 61  
<211> 28  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>  
<221> MOD\_RES  
<222> (23)  
<223> tButylgly



2nd Revised 256-152div corrected in response to notice to comply.txt

<220>

<223> C-term amidated

<400> 61

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Xaa Glu Trp Leu Lys Asn  
20 25

<210> 62

<211> 28

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 62

His Gly Glu Gly Thr Phe Thr Ser Asp Leu Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Asp Phe Leu Lys Asn  
20 25

<210> 63

<211> 33

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<223> C-term amidated

<400> 63

His Gly Glu Gly Thr Phe Thr Ser Asp Ala Ser Lys Gln Leu Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Phe Leu Lys Asn Gly Gly Pro Ser  
20 25 30

Ser

<210> 64

<211> 29

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

2nd Revised 256-152div corrected in response to notice to comply.txt

<220>

<223> C-term amidated

<400> 64

His Gly Glu Gly Thr Phe Thr Ser Asp Ala Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly  
20 25

<210> 65

<211> 37

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Exendin or  
GLP-1 agonist

<220>

<221> MOD\_RES

<222> (31)

<223> hPro

<220>

<221> MOD\_RES

<222> (36)..(37)

<223> hPro

<220>

<223> C-term amidated

<400> 65

His Gly Glu Gly Thr Phe Thr Ser Asp Ala Ser Lys Gln Met Glu Glu  
1 5 10 15

Glu Ala Val Arg Leu Phe Ile Glu Trp Leu Lys Asn Gly Gly Xaa Ser  
20 25 30

Ser Gly Ala Xaa Xaa  
35

<210> 66

<211> 29

<212> PRT

<213> artificial sequence

<220>

<223> Agonist of GLP-1

<220>

<221> MOD\_RES

<222> (1)..(1)

<223> Ala is modified with an R group which can be 4-imidazopropionyl  
(des-amino-histidyl), 4-imidazoacetyl, or 4-imidazo-a,  
adimethyl-acetyl

<220>

<221> MOD\_RES

2nd Revised 256-152div corrected in response to notice to comply.txt  
<222> (19)..(19)  
<223> Xaa is a Lys or Arg

<220>  
<221> MOD\_RES  
<222> (27)..(27)  
<223> Lys is modified with an R group consisting of C6 -C10 unbranched acyl, or is absent

<220>  
<221> MOD\_RES  
<222> (29)..(29)  
<223> Arg is modified with an R group consisting of Gly-OH or NH2

<400> 66

Ala Glu Gly Thr Phe Thr Ser Asp Val Ser Ser Tyr Leu Glu Gly Gln  
1 5 10 15

Ala Ala Xaa Glu Phe Ile Ala Trp Leu Val Lys Gly Arg  
20 25

<210> 67  
<211> 19  
<212> PRT  
<213> artifical sequence

<220>  
<221> MOD\_RES  
<222> (1)..(1)  
<223> Ser is modified by H2N, H2N-Ser, H2N-Val-Ser, H2N-Asp-Val-Ser. or any one of SEQ ID NO:68 to 74

<220>  
<221> MOD\_RES  
<222> (17)..(17)  
<223> Xaa is a Lys or Arg .

<220>  
<221> MOD\_RES  
<222> (19)..(19)  
<223> Arg can be modified by the group consisting of NH2, OH, Gly-NH2, or Gly-OH

<400> 67

Ser Tyr Leu Glu Gly Gln Ala Ala Lys Glu Phe Ile Ala Trp Leu Val  
1 5 10 15

Xaa Gly Arg

<210> 68  
<211> 4  
<212> PRT  
<213> artificial sequence

2nd Revised 256-152div corrected in response to notice to comply.txt

<220>

<223> variable sequence insert for artificial GLP-1 analog

<400> 68

Ser Asp Val Ser

1

<210> 69

<211> 5

<212> PRT

<213> artificial sequence

<220>

<223> variable sequence insert for artificial GLP-1 analog

<400> 69

Thr Ser Asp Val Ser

1

5

<210> 70

<211> 6

<212> PRT

<213> artificial sequence

<220>

<223> variable sequence insert for artificial GLP-1 analog

<400> 70

Phe Thr Ser Asp Val Ser

1

5

<210> 71

<211> 7

<212> PRT

<213> artificial sequence

<220>

<223> variable sequence insert for artificial GLP-1 analog

<400> 71

Thr Phe Thr Ser Asp Val Ser

1

5

<210> 72

<211> 8

<212> PRT

<213> artificial sequence

<220>

<223> variable sequence insert for artificial GLP-1 analog

<400> 72

Gly Thr Phe Thr Ser Asp Val Ser

1 2nd Revised 256-152div corrected in response to notice to comply.txt  
5

<210> 73  
<211> 9  
<212> PRT  
<213> artificial sequence

<220>  
<223> variable sequence insert for artificial GLP-1 analog

<400> 73

Glu Gly Thr Phe Thr Ser Asp Val Ser  
1 5

<210> 74  
<211> 10  
<212> PRT  
<213> artificial sequence

<220>  
<223> variable sequence insert for artificial GLP-1 analog

<400> 74

Ala Glu Gly Thr Phe Thr Ser Asp Val Ser  
1 5 10

<210> 75  
<211> 29  
<212> PRT  
<213> artificial sequence

<220>  
<223> artificial

<220>  
<221> MOD\_RES  
<222> (1)..(1)  
<223> neutral amino acid or D or N-acylated or alkylated form of histidine can be substituted for His

<220>  
<221> MOD\_RES  
<222> (2)..(2)  
<223> small neutral amino acid can be substituted for Ala

<220>  
<221> MOD\_RES  
<222> (3)..(3)  
<223> acidic or neutral amino acid can be substituted for Glu

<220>  
<221> MOD\_RES  
<222> (4)..(4)  
<223> neutral amino acid can be substituted for Gly

<220>  
<221> MOD\_RES

2nd Revised 256-152div corrected in response to notice to comply.txt

<222> (9)..(9)  
 <223> acidic amino acid can be substituted for Asp

<220>  
 <221> MOD\_RES  
 <222> (10)..(10)  
 <223> Tyr can be substituted for Val

<220>  
 <221> MOD\_RES  
 <222> (12)..(12)  
 <223> Lys can be substituted for Ser

<220>  
 <221> MOD\_RES  
 <222> (15)..(15)  
 <223> Asp can be substituted for Glu

<220>  
 <221> MOD\_RES  
 <222> (16)..(16)  
 <223> Ser can be substituted for Gly

<220>  
 <221> MOD\_RES  
 <222> (17)..(17)  
 <223> Arg can be substituted for Gln

<220>  
 <221> MOD\_RES  
 <222> (18)..(18)  
 <223> Arg can be substituted for Ala

<220>  
 <221> MOD\_RES  
 <222> (20)..(20)  
 <223> Lys can be substituted for a neutral amino acid, arg, or a D form of lys

<220>  
 <221> MOD\_RES  
 <222> (20)..(20)  
 <223> Gln can be substituted for Lys

<220>  
 <221> MOD\_RES  
 <222> (25)..(25)  
 <223> Trp can be substituted for an oxidation-resistant amino acid

<220>  
 <221> MOD\_RES  
 <222> (28)..(28)  
 <223> Lys can be substituted for a neutral amino acid, arg, or a D form of lys

<220>  
 <221> MOD\_RES  
 <222> (29)..(29)  
 <223> Xaa is a Gly, Gly-Arg, Gly-Arg-Gly, or absent

<400> 75

2nd Revised 256-152div corrected in response to notice to comply.txt

His Ala Glu Gly Thr Phe Thr Ser Asp Val Ser Ser Tyr Leu Glu Gly  
1 5 10 15

Gln Ala Ala Lys Glu Phe Ile Ala Trp Leu Val Lys Xaa  
20 25